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ABSTRACT

To further an explanation of the post-1970 United States demographic phenomenon of increased population for non-metropolitan areas, the relationship of 3 ecological phenomena to non-metropolitan net migration rates between the 1960's and the 1970's is examined for a random stratified sample of 380 United States non-metropolitan counties (primarily using U.S. Department of Agriculture data). The ecological phenomena studied as possible explanations of the change are: sustenance organization, including overall functional specialization and employment change; change in the age structure, especially the population in the highly mobile "young adult" years; and "spillover", the expansion of metropolitan population and activities into non-metropolitan areas. Findings support existing literature and indicate that changes in the overall number of employment opportunities, changes in specialization of sustenance organization, and sustenance activity in all categories but mining are not significantly related to net migration change. There is, however, a significant link between net non-metropolitan migration change and change in age structure of non-metropolitan populations as well as metropolitan "spillover". Therefore, gains in net migration rates of non-metropolitan counties in the 1970's do not signal the development of new population redistribution mechanisms; rather, they can be viewed as a result of the continued operation of traditional processes. (Author/SB)

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NET MIGRATION CHANGE IN U. S. NONMETROPOLITAN COUNTIES, 1960-74: A TEST OF THREE ALTERNATIVE HYPOTHESES

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ABSTRACT

This research examines the difference in annual net migration rates between the 1960's and 1970's for a random stratified sample of 380 U. S. counties classified as nonmetropolitan in 1970. Our findings indicate that changes in the overall number of employment opportunities, changes in the specialization of sustenance organization, and sustenance activity in all categories except mining are not significantly related to net migration change. Support is forthcoming, however, for hypotheses that link net migration change with changes in the age structure of nonmetropolitan populations and to the "spillover" from metropolitan areas.

We conclude that gains in net migration rates of nonmetropolitan counties in the 1970's do not signal the development of new population redistribution mechanisms but can be viewed as a result of the continued operation of traditional processes. Specifically, current nonmetropolitan net migration trends have resulted from the ongoing decentralization of population and activities from metropolitan areas and equilibrating processes in nonmetropolitan areas themselves.

INTRODUCTION

The spatial redistribution of America's population historically has been a movement from rural to urban areas, so sociologists literally have had decades to examine the forces leading to the metropolitanization of the nation. In recent years, however, the attention of sociologists and other social scientists has started turning toward a new phenomenon, the post 1970 reversal of nonmetropolitan population growth, especially net migration trends. Estimates provided by the U.S. Census show that between 1970 and 1973, U.S. nonmetropolitan counties experienced a net in-migration of 1.1 million persons. This phenomenon is a reversal from the net out-migration of 3 million persons registered in the 1960-70 period. Metropolitan areas experienced a net in-migration of only .5 million persons in the 1970-73 period, a drop from 6 million net in-migrants received in the 1960-70 decade (Beale and Fuguitt, 1975:21). More recent estimates suggest that this net in-migration in nonmetropolitan areas has continued into the mid-1970's (Beale, 1976).

Several sociologists (Tucker, 1976; Wardwell, 1977) have examined this contemporary demographic shift by examining changes in size and nature of the metropolitan to nonmetropolitan net migration streams. Others (Beale, 1975, 1976; Beale and Fuguitt, 1975; Humphrey et al., 1977; Morrison and Wheeler, 1976) have focused on elucidating the relationship between net migration and the functional and demographic characteristics of individual nonmetropolitan areas in an attempt to determine what particular types of areas have experienced gains in net migration rates and why they have done so.

The present research extends work of the second group of scholars by determining the relative validity of several alternative explanations of the change in nonmetropolitan county annual net migration rates between the 1960-1970 period and the 1970-1974 period. Specifically our research examines the relationship of change in nonmetropolita net migration trends and three ecological phenomenon: (1) sustenance organization - including overall functional specialization and employment change; (2) the change in the age structure - especially the population in the highly mobile "young adult" years; and (3) spillover - the expansion of metropolitan population and activities intc nonmetropolitan areas.

Several aspects of this research are unique and enhance its contribution to the understanding of net migration change in general and non-metropolitan net migration change in particular. First, the dependent and many of the independent variables are measured in a dynamic rather than a static framework. We have examined the relationship of changes in various ecological phenomenon and the change in annual net migration rates between the 1960's and 1970's. Second we develop and test explicit hypotheses to account for variation in annual net migration rates between individual counties. Finally our findings point to a number of conclusions about the possible causes of the post 1970 net migration to nonmetropolitan areas which have not been documented by other researchers.

THEORY AND REVIEW OF LITERATURE[1]

Sustenance Organization

Ecological studies of population movements to and from territorially based communities explain migration as a consequence of community sustenance organization. By sustenance organization we mean the manner in which the community's resources, including capital and labor, provide support for the area's population. The nature and size of the activities which, of course, reflect environmental factors and the level of specific technologies that make up the sustenance organization influence the competitive position of the area within the intercommunity hierarchy. Areas performing a particular function or producing a good demanded by other areas will be likely to experience an expansion of sustenance organization and concomitantly undergo population growth. This argument reflects a fundamental tenet of human ecology - that a population will tend to redistribute itself through the vital processes and migration to reach a balance or equilibrium between population size and opportunities for sustenance or employment (Hawley, 1968: 331).

While human ecological theory has not developed a set of formal propositions based on the above rationale, various researchers examining nonmetropolitan demographic change have focused on several different components of sustenance organization. The first component is the change in the overall size of an area's sustenance organization as measured by the change in total employment opportunities of a community. For example, Clemente (1975: 2) and Lowry (1966: 30) report that the growth of economic activity in nonmetropolitan and metropolitan places respectively is positively related to changes in in-migration. Evans (1975: 33), however,

found that increases in the number of manufacturing jobs in nonmetropolitan counties did not significantly effect patterns of in or outmigration. We feel it is logical to argue that changes in the overall number of employment opportunities located in an area can be expected to be positively related to changes in annual rates of net migration.[2]

A second component of sustenance organization that affects net migration change is the degree of functional specialization of a community. We distinguish here between a change in overall employment opportunities which may be dispersed over several functions indicating a general growth of economic activity and a change in the overall functional specialization of an area. In the later case, the expansion of employment opportunities occurs primarily in one particular economic sector. This constitutes a qualitatively different phenomenon from general economic growth and should also influence net migration trends.

Increases in the functional specialization of a community are sociologically important because they provide places with a competitive edge in the daily interaction and the flow of persons. If a new specialty is needed within an urban region, the place with that new specialty can capture workers, clients, and the business of outside service firms. A specialization in step with local and regional demands for goods and services can increase the dominance of a community in comparison with other places of the same size in the network of intercommunity interactions. We hypothesize, therefore that nonmetropolitan areas which have increased the number of activities in which they are specialized should have experienced increases in net migration rates in the 1970's.

Several authors have documented significant findings concerning the relationship between functional specialization and demographic change in nonmetropolitan areas. Humphrey et.al. (1977) report that Pennsylvania nonmetropolitan minor civil divisions that experienced a turnaround to net in-migration during the 1960's after several decades of net out-migration were more specialized than those places where no such shift occurred. Tarver (1972) found that the degree of functional specialization of small Southern nonmetropolitan towns was positively related to overall population change. Finally, Frisbie and Poston (1976) have documented that the structure of sustenance organizations of growing communities in 1960 was more complex or had more distinct functions than that of declining counties.

Finally, in addition to the change in the number of employment opportunities and degree of functional specialization, we can expect that the type of activities that characterize an area's sustenance organization will also be related to net migration experiences. As Frisbie and Poston (1975: 775) note, "it is inconceivable that all sustenance activities relate in the same way to population change". Nor, we might add, is it likely that the same activity will bear the same relationship to population change continually from one decade to another.

Turning to a review of recent research to illustrate this point we see that neither Beale (1975) nor Beale and Fuguitt (1976) report a strong relationship between changes in manufacturing activity and post 1970 nonmetropolitan population changes. Beale and Fuguitt (1975: 16) take this finding as evidence of the increased importance of growth in trade and other manufacturing activities in nonmetro-

politan areas. This finding is contrary to research examining nonmetropolitan population change between 1950 and 1960 (Tarver and Beale, 1968: 17-19) and 1960 and 1970 (Frisbie and Poston 1975: 778). Both of these authors report a positive relationship between population change and manufacturing activity.

We take the direct relation between manufacturing and growth as evidence of the changing demographic impact of manufacturing in nonmetropolitan America. According to Beale (1976: 7), only 3% of all nonmetropolitan employment growth between 1970 and 1976 was in manufacturing. Thus, nonmetropolitan areas that relied heavily on manufacturing growth as a means to recover previous population losses in the 1960's have found themselves dependent on a mode of production that has undergone relatively little expansion in the 1970's. We therefore expect the proportion of sustenance activity in the manufacturing sector to be negatively related to changes in rates of net migration.

On the other hand, we expect that the proportion of sustenance organization in a nonmetropolitan area devoted to wholesale, retail, and service activities will be positively related to changes in rates of net migration. The primary reason for hypothesizing such a relationship is the same basic one we have already discussed in relation to manufacturing--the shift in growth of employment from manufacturing to the service industry. Contemporary society has become more and more service-oriented. Frisbie and Poston (1975:776) note that there has been a rapid growth in the demand for wholesale, retail, financial, educational and administrative functions. Morrison and McCarthy (1977: 4) argue that the nationwide expansion of trade and service sectors at the expense of manufacturing is one

of the industrial trends that has altered the fortunes of specific regions and types of locales in nonmetropolitan America during the 1970's. These sectors represent the most rapidly growing areas of employment in nonmetropolitan areas in the 1970's. Places that have large proportions of their sustenance organizations involved in such activities will likely be experiencing increases in employment opportunities. Thus, such places have an edge over other communities in attracting and/or retaining population and in registering increases in net migration.

Finally, a third type of sustenance activity involves extractive industries such as agriculture and mining. Areas historically dependent on such activities have been losing population because these industries have become increasingly mechanized, productive, and capital intensive resulting in an oversupply of population due to increased labor requirements (Hawley, 1971: 154-155). Such an imbalance has forced adjustments in population processes, most notably increases in out-migration.

There are several reasons to argue that mining and/or farm areas should be registering increases in rates of net migration in the 1970's. First, it is entirely possible that they have reached a point where the "push" factors that were previously operating to bring about net out-migration have receded to where they are no longer offsetting in-migration. Ecologically, population in communities specialized in sustenance activities such as mining may have re-established an equilibrium condition. Second, the industrialization of nonmetropolitan areas during the past twenty years has provided new opportunities in some areas that were primarily agricultural. Third, the phenomenon of "return migration" may be

affecting agricultural and mining areas significantly. Fourth, agricultural areas may possess environmental characteristics that are becoming increasingly valued by individuals in their search for a satisfactory living environment including low density, scenic beauty, low crime rates, and clean air. Finally, the "energy crisis" and the resulting increase in the use of domestic coal in the 1970's may have brought increases in activity in formerly decaying mining areas. Morrison and McCarthy (1977: 4) have identified the revival or expansion of extractive energy-related industries as one of the industrial trends that has improved the population retention of some nonmetropolitan areas in the 1970's. While we can not hypothesize the relative degree to which each of these factors has contributed to net migration change in this research, we can test the hypothesis that the proportion of sustenance activity in agriculture and mining is positively related to the change in the annual rate of net migration between the 1960's and 1970's.

Thus, we have seen that other researchers have examined the relationship between nonmetropolitan sustenance organization and demographic change. Frisbie and Poston (1975, 1976) have looked at this problem with data from the 1960's. Our work is relevant because it will extend this line of inquiry into the 1970's. By using Frisbie and Poston's findings as a base for comparison, we will be able to shed some light on the question of whether or not the demographic consequences of various sustenance organization components are changing as nonmetropolitan areas continue to be affected by structural changes occurring in society.

We have been careful to distinguish between components of sustenance organization such as the nature of activities (manufactur-

ing or mining) and functional specialization. Although conceptualized as separate dimensions, it is clear that these may be related with each other or with other variables used in this analysis. For example, Duncan and Reiss (1956: 198) have noted that areas with a heavy involvement in manufacturing do not develop specialties in other activities. Thus, the fact that an area's sustenance organization is dominated by manufacturing may also indicate that it will be relatively stagnant in terms of developing new specialties. Manufacturing has also traditionally been located near older and more urbanized areas in or around metropolitan centers. Urbanization and proximity to a metropolitan area are characteristics which in and of themselves may be negatively associated with net migration change in the 1970's. It will be necessary, therefore, to guard against such possibly confounding effects by carefully controlling for relevant variables during examination of the data.

Age Structure

Perhaps the most reliable finding of demographic research is that a clear age differential exists in migration with young adults between the ages of 18-35 compromising the most mobile segment of the population (Shaw, 1975: 18-19; Bogue, 1969: 763). Thus we would expect that areas with net out-migration would be experiencing changes in the age structure of their populations. This change could paradoxically bring about a reversal in net migration trends largely independent of changes in sustenance organization.

We conceive of this change taking place in the following manner. As net out-migration occurs, the proportion of young "geographically mobile" adults in the population decreases leaving behind an older and more residentially stable age structure. Consequently, rates of

out-migration decrease with the shrinking of the young adult population. The small amounts of in-migration that have occurred in the past (or small increases in in-migration) result in an overall shift to net migration. Even though the degree of functional specialization or number of employment opportunities in a nonmetropolitan area may be increasing, these factors may be relatively unimportant compared to the demographic changes which occurred in response to previous economic conditions.

While we would expect the "aging of the population" explanation of net migration change to be most applicable to areas with histories of substantial net out-migration such as agricultural and mining areas, it is reasonable to hypothesize that changes in the age structure of all nonmetropolitan areas have had some role in changes in rates of net migration. Thus, we hypothesize an alternative explanation of nonmetropolitan net migration change; the change in the proportion of the population between the years 18 and 35 (or "aging" of the population) between 1960 and 1970 is negatively related to the change in the annual rate of net migration.

Spillover

Finally, we introduce a third alternative explanation of nonmetropolitan net migration change: "spillover" or decentralization of population from metropolitan areas. Aided by technological improvements in transportation and communication, metropolitan population has been moving steadily outward from metropolitan central cities to suburban rings and beyond throughout the twentieth century (Hawley, 1971: 1956). The outward movement of population has occurred concomitantly with the decentralization of economic activities from central locations in metropolitan areas.

Observers of the post 1970 nonmetropolitan net migration shifts hold different views on the role played by spillover in nonmetropolitan growth. Beale and Fuguitt (1975: 23) argue that the reversal is more than just a result of metropolitan sprawl into a adjacent nonmetropolitan areas. They note that 60% of all nonmetropolitan counties not adjacent to metropolitan areas recorded a net gain through migration in the 1970's as compared to 68% of the adjacent counties and that 3/8 of the total net in-migration into nonmetropolitan areas occurred in nonadjacent counties. Others such as Wardwell (1977) argue that spillover has actually accounted for a greater proportion of the nationwide shift in non-metro-metro movement between the 1960's and 1970's than Beale and Fuguitt indicate. He notes that 1/4 of the population growth in nonmetropolitan counties since 1970 has taken place in those counties classified as nonmetropolitan in 1970 but reclassified as metropolitan in 1974 (Wardwell, 1977: 159).

An important point to be made concerning the role of metropolitan expansion in accounting for post 1970 nonmetropolitan net migration trends is that while numerous authors disagree on its importance, very little effort has been made to specify how the process actually proceeds. We conceive of this process as unfolding in the following manner. As people move away from central cities, the density in the outer reaches of metropolitan areas increases until these areas are saturated with people and the accompanying physical structures which constitute man's adaption to the environment. At some unspecified point in time, the population pressure in these places becomes too great and the population "spills over" into contiguous nonmetropolitan areas.

Whether or not and when a nonmetropolitan area receives any of this spillover is most likely determined by the physical proximity of that area to a metropolitan community. Thus we conceive of the spillover process as unfolding in a uniform manner with nonmetropolitan areas closest or contiguous to metropolitan areas being the first to be affected. As the process continues, these areas become densely settled, necessitating a further outward spread of population. This research conceptualizes the spillover process along two inter-related dimensions - time and space. To provide an adequate test of spillover it must be shown that non-metropolitan places closer to metropolitan centers have experienced changes in rates of net migration in the appropriate direction at an earlier time than more remote nonmetropolitan places. A rigorous test of the "spillover" hypothesis will be conducted in this research with longitudinal data. In doing so, the first careful examination of this hypothesis will be offered for the literature on nonmetropolitan population growth.

SUMMARY OF HYPOTHESES

Employment Opportunities

1. The annual rate of growth of total employment opportunities located in a nonmetropolitan area between 1960 and 1970 is positively related to the change in the annual rate of net migration between the 1960's and 1970's.

Functional Specialization

2. The change in the degree of functional specialization of a nonmetropolitan area between 1960 and 1970 is positively related to the change in the annual rate of net migration between the 1960's and 1970's.

Type of Sustenance Activity

3. The proportion of sustenance organization in an area involved in retail, wholesale, and service activities in 1970 is positively related to the change in the annual rate of net migration between the 1960's and 1970's.

4. The proportion of sustenance organization in an area involved in agricultural and mining activities in 1970 is positively related to the change in the annual rate of net migration between the 1960's and 1970's.

5. The proportion of sustenance organization in an area in 1970 involved in manufacturing is negatively related to the change in the annual rate of net migration between the 1960's and 1970's.

Age Structure

6. Reductions in the percentage of residents 15-34 in the 1960's are positively related to the change in the annual rate of net migration in nonmetropolitan areas between the 1960's and 1970's.

Spillover

7. Nonmetropolitan areas which experienced increases in annual rates of net migration in the 1970's are further away from the central cities of metropolitan areas than nonmetropolitan areas that experienced such increases in the 1960's, but closer to central cities of metropolitan areas which have experienced no increases in annual rates of net migration since 1950.

METHODOLOGY

The above hypotheses are tested with a sample of all U. S. counties classified as nonmetropolitan in 1970 by the U. S. Bureau of the Census. We obtain the sample by classifying the nonmetropolitan counties into four regions: North East, North Central, South and West. The counties in each region are subdivided on the basis of their spatial proximity to the nearest Standard Metropolitan Statistical Area (SMSA). We then take a 15 percent random selection of cases from each of the eight subcategories of nonmetropolitan counties, resulting in a sample of 380 counties. Z-scores on the differences between the sample and population (all U.S. nonmetropolitan counties) means of several variables used in this research

were computed to test the representativeness of our sample. None of the recorded Z-scores fall into the critical region and we therefore have no reason to suspect a biased sample.

Most previous research on the relationship of demographic trends and changes in sustenance organization use data based on the place of residence of employed persons (Frisbie and Poston, 1975, 1976). One consequence of relying on this data is that measures of sustenance activities include out-commuters and exclude sustenance opportunities located in a county for in-commuters. To provide a more accurate measure of sustenance opportunities, we use employment data based on establishments located in the county (U.S. Bureau of the Census, 1961, 1971b, 1974c).

Two sources of data are used to measure net migration change for the selected counties. Our primary source of information is a data base supplied by the U.S. Department of Agriculture.[3] We also use estimates of age-specific and overall net migration rates for the sample from work by Bowles and Lee.[4] The dependent variable for this research, the change in the annual rate of net migration between the 1970's and 1960's, is the remainder produced by subtracting the 1960-1970 annual rate from the 1970-74 annual rate.

The nature of sustenance activities of each county is measured as the percentage of employment in agriculture, mining, service, manufacturing, retail, wholesale and several other types of industry. The change in functional specialization refers to change in these categories of industry relative to the average change in that particular category which occurs in other nonmetropolitan counties between the two periods of time. An area with an increase in employment of greater or equal to one standard deviation from the

mean is increasing in specialization in that category (Nelson, 1955; Tarver, 1972). The change in overall functional specialization is measured by summing the industrial categories in which an area has an increasing specialization.

Other variables used in this research include:

1. Distance to a metropolitan area (SMSA) is measured as the straight line distance from the center of a nonmetropolitan county to the central city of the nearest SMSA.

2. Change in age structure is measured as the percent difference between residents 15-34 for each intercensal period.

3. Population size is the estimate in the decennial census.

4. Degree of urbanization is the percentage of a county population living in places of 2,500 inhabitants or more at a given census.

5. Size of nearest metropolitan area is the 1970 population of the closest SMSA to a selected county.

6. Out-commuting is measured as the percentage of a county's inhabitants reporting a place of work outside their resident county at the time of the 1970 census.

7. In-commuting is the percentage of employment opportunities in a county filled by nonresidents at the time of the 1970 census.

Pearsonian correlation, partial correlation, analysis of variance, and step-wise multiple regression analysis are used to test the hypotheses in this research.[5] In the regression analysis the independent variables are entered into the equation of the step-wise procedure one at a time in descending order based upon the proportion of variance in the dependent variable which they explain. By examining the beta coefficient at each step with a statistical F-test, the researcher can identify the simplest linear regression equation for net migration change and determine what independent variables are statistically related to this demographic change at the .05 level of significance.

FINDINGS

The hypothesized relationships between the various components of sustenance organization and the change of annual rates of nonmetropolitan net migration are largely unsupported by the data. In Table 1, we see that a change in the rate of expansion in sustenance opportunities is not statistically related to nonmetropolitan net migration change between 1960-70 and 1970-74. Even when we

(Table 1 about here)

statistically control for commuting, the relationship between change in sustenance opportunities and net migration remains statistically nonsignificant. Additional statistical controls for distance to the nearest SMSA, size of the nearest SMSA, population of the county, and degree of urbanization further substantiate the finding that change in sustenance opportunities is not related to change in net migration for these nonmetropolitan counties.

Nor do our findings substantiate the hypothesis that increasing functional specialization leads to nonmetropolitan growth through net migration. The zero-order correlation between the change in the overall functional specialization in nonmetropolotan counties and the change in the annual rate of net migration for the 1960-70 and 1970-74 period is statistically significant at the .05 level, as evident in Table 2. A careful examination of this relationship

(Table 2 about here)

with partial correlation analysis, however, eliminated the statistical significance of this original relationship. The statistical association between change in overall functional specialization and net migration change is nearly reduced to zero when one uses the partial correlation analysis controlling on a number of variables

including the 1970 population size and the degree of urbanization in the county. More specifically, the positive zero-order relationship between net migration and functional specialization change suggests that greater increases in specialization have occurred in smaller and less urbanized places, and it is these characteristics which are associated with greater gains in annual rates of net migration.[6]

The findings also indicate that specific types of sustenance activity, with the exception of service, mining, and manufacturing, are unrelated to net migration (Table 3). Working with the assump-

(Table 3 about here)

tion that the relationship between specific types of an activity and net migration change might be suppressed or distorted in some way, we again used partial correlation analysis with control variables such as distance to an SMSA, urbanization in each selected county, and the other previously discussed controls.

The introduction of these variables as controls, evident in Table 3, reduced to nonsignificance the relationship between service and manufacturing activity and the change in annual rates of net migration, but did not alter the association of mining and the dependent variable. Concomitantly, the observed nonsignificant zero-order relationships between wholesale, retail, and agricultural activity and net migration change were not found to be the result of suppressor variables.

In the case of manufacturing activity, the original significant negative association is reduced when we control for distance to the nearest SMSA, population size, and overall functional specialization.[7] Apparently manufacturing was more predominant in counties closer to SMSA's, larger in population size, and specialized in fewer activities. Counties with these characteristics experience less

gains in annual rates of net migration.[8] Thus it is not a relatively heavy concentration in manufacturing itself that leads to less migration change, but that areas with more extensive manufacturing bases have other attributes which are responsible for the lack of gain in net migration rates.

Looking at the relationship between service activity and change in the annual rate of net migration in Table 3, we see that the partial correlation association remained statistically significant at the .05 level when controlling for all variables except distance to the nearest SMSA. From Table 4 we see that distance was positively related to the proportion of workers in a county in service activity

(Table 4 about here)

and positively related to change in the annual rate of net migration. The effect of distance increased the positive relationship between service activity and the dependent variable. When the influence of distance was removed, the original zero-order correlation was reduced.

The research does suggest that change in the age structure of non-metropolitan counties is a statistically significant explanation of growth in the nonmetropolitan sector. The zero-order relationship

(Table 5 about here)

in Table 5 between the change in the proportion of a population in the ages 15-34 between 1960 and 1970 and the change in the annual rate of net migration over the entire 1960-74 period was statistically significant and moderate in strength ($r = -.355$, $p = .001$). Because of the way change in age structure is measured, a negative relationship indicates that the greater the reduction in the proportion of population in the ages 15-34 between 1960-70, the greater the increase in net migration rates over the entire period in question.

As the highly mobile age group diminishes in size in nonmetropolitan counties, net migration rates become more positive. This finding remains statistically significant even when the control variables are entered in the partial correlation analysis.

Our findings also verify the hypothesis that the closer the nonmetropolitan area is to a metropolitan area, the earlier in time it experiences net migration gain. We computed this finding with a different procedure than in the earlier tests. An analysis of variance tests whether there are statistically significant differences between the mean distances from metropolitan areas to nonmetropolitan counties that: (1) first experienced gains in net migration between the decade of the 1950's and the 1960's; (2) first experienced gains between the 1960's and 1970's; and (3) did not gain in net migration during the 1950-70 period. The size of the nearest SMSA and the geographic region of the county also are entered into the analysis of covariates to test for interaction effects.

The results of the analysis of variance indicate significant differences even when the control factors are introduced. Thus, significant differences exist in the distances from SMSA's of nonmetropolitan counties that have undergone gains in net migration at different time periods--independent of the size of the particular SMSA. This finding, however, does not tell us anything about the strength of the relationship nor, in fact, if the distance is greater the more recent the time period. Using dummy variables for the time dimension, we also computed a correlation coefficient between time and distance and a partial correlation coefficient controlling for region and size of nearest SMSA. The zero-order correlation is statistically significant and remains unaffected by

the control factors (r = .119, p = .01). The greater the distance to an SMSA, the later in time the net migration gain.

The results of the miltiple regression analysis are consistent with those already reported. Entering all the independent and control variables into the regression format, we found only five variables with beta coefficients significant at the .01 level or better. Mining and service activity were positively related while

(Table 6 about here)

degree of urbanization, size of nearest SMSA, and change in population aged 15-34 were negatively related to the change in annual rates of net migration (See Table 6). These five variables were related to the dependent variable independently of themselves and all other variables used in this research.

DISCUSSION

It would be incorrect to conclude from this research that the "rural renaissance" in America represents the emergence of new trends that serve as harbingers of change in the underlying processes which have traditionally influenced the geographic redistribution of this nation's population. The data presented in this research supports the contention of Morrison and Wheeler (1976: 19) that, "...the growth of settlements in areas remote from urban influence... can be regarded as extensions of the basic urbanization process that has always shaped population distribution in the U.S.", and Morrison and McCarthy (1977: i) that, "... sharply accelerated migration into nonmetropolitan areas is a manifestation of outward metropolitan expansion." These statements are underscored by finding that rates of net migration have been greater in nonmetropolitan counties which are less urbanized and further away from metropolitan areas and the support presented for the spillover hypothesis.

Accelerated by technological advancements in transportation and communication, this continued urbanization has spread beyond the nonmetropolitan counties surrounding SMSA's to counties formerly considered remote. These counties can now receive the benefits of urban services and activities even though they lie beyond the daily commuting shed of metropolitan areas.

As urbanization and the concomitant decentralization of population from metropolitan areas has continued, more remote and previously less urbanized areas show greater increases in rates of net migration and population growth. One basic reason for this is that such areas have traditionally suffered net out-migration and population losses. This has resulted in their having smaller base populations than counties closer to metropolitan areas. Even though net migration changes in these traditionally declining areas may not be large in absolute numbers, they translate into significant rate changes. Also it should be no surprise that more urbanized nonmetropolitan counties closer to SMSA's experienced lower rates of net migration in the 1970's. They have benefited from metropolitan decentralization for decades and may, in fact, have begun to decentralize themselves.

Consistent with this argument is the idea that much of the change in the annual rates of net migration in nonmetropolitan counties between the 1960's and 1970's can be related to an important principle of ecological theory: areas tend to maintain a balance between population size and other factors. While ecologists (Hawley, 1950; Frisbie and Poston, 1975) have specifically referred to sustenance opportunities as a limiting factor of population growth, we feel that the idea of balance has a broader applica-

tion to the understanding of contemporary nonmetropolitan net migration trends.

Just as an area can not endlessly experience population growth, neither is it likely that an area will undergo population decline without some eventual adjustment which inhibits further population loss. At some point a tenuous equivalence is reached and previous demographic trends are altered. We call this the "change without change" hypothesis. That is, the change in the rates of net migration of some nonmetropolitan areas may not be a result of the expansion of rural "growth industries" or an actual shift in individual preferences to more remote and less urbanized residential environments. Rather, the change may simply have resulted from demographic consequences inherent in the previous population histories of these areas.

One piece of evidence for this argument is our finding that the greater the reduction in the proportion of a population between the ages 15-34, the greater the gain in net migration rates. Persons in this age category are known to be highly mobile, and we would expect areas declining in population to be experiencing net out-migration in this age group. This net out-migration reduces the size of the age category and will, over time, result in an age structure with fewer people in the highly mobile ages. Such a reduction is an unintended consequence which serves to eventually alter the net migration experiences of a county. Thus net migration trends change as the result of the demographic consequences of the trends themselves.

This argument can also be extended to the economic sector. Nonmetropolitan counties with little or no employment increase prior to the 1970's have experienced net out-migration. It may be that this

exodus of people has brought the population size of these areas into balance with sustenance opportunities. The continuation of such out-migration becomes unnecessary and the rates of net migration, compared to earlier years, become more positive regardless of the specific economic base. As Hines, et. al., (1975: 23) have suggested, "the determinants of nonmetropolitan population decline may be transitory--e.g., population decline may reflect a period of adjustment in manpower needs of agriculture, forestry, mining, and other extractive industries."

Other findings reported in this research also supported the idea that the demographic effect of particular sustenance activities in nonmetropolitan areas may indeed be transitory. We did not find the negative associations between demographic change and wholesale, mining or agricultural activity or the positive relationship between it and retail activity reported by Frisbie and Poston (1975) for the 1960's. It is certainly possible that these differences may partially be accounted for by the operational procedures used in each piece of research. However, it appears more likely that they reflect actual changes in the relationship between various sustenance activities and demographic change. For example, we found that a relatively large involvement in an expanding economic sector such as mining and service industries improved the net migration fortunes of nonmetropolitan areas,[9] while a large proportion of sustenance organization devoted to manufacturing was not positively related to net migration change. These findings are contradictory to the relationships between sustenance activities and population change that have traditionally existed in nonmetropolitan areas. A relationship still exists between sustenance organization activities and population change, but areas

characterized by certain functions are no longer undergoing the same demographic experiences as before.

Our data do not suggest that post 1970 net migration trends signal large scale shifts in the processes that underlie nonmetropolitan population change. The centrifugal forces which accompanied urbanization and industrialization have drawn population to urban centers for over one hundred years. The twentieth century, especially after World War II, has seen the evolution of centripetal forces which have speeded the decentralization of population from metropolitan areas. In addition, nonmetropolitan areas which had suffered the net out-migration of young adults in previous decades now appear to be increasing their population retention capabilities as their age structures change. It is too early to hazard a prediction as to how long nonmetropolitan net migration and growth trends will continue. Even if the population trends in the 1970's reflect an equilibrium in the exchange of population between metropolitan and nonmetropolitan areas (Wardwell, 1976), these trends will undoubtedly influence future demographic events in nonmetropolitan areas and are worthy of further investigation by demographers and other social scientists.

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Table 1

Zero-Order and Partial Correlation Coefficients Showing the Relationship of the Change in the Annual Rate of Net Migration Between the 1960's and 1970's and the Change in Total Employment Between 1960 and 1970

Dependent Variable (Y)	Independent Variable (X)	Control Variable (Z)	r_{xy}[1]	$r_{xy.z}$[2]	Significance
Change in Net Migration Rate	Employment Change		.038		.233
		Distance to SMSA		.041	.214
		Population Size		.036	.243
		Size of SMSA		.035	.248
		Degree of Urbanization		.017	.372
		% In-Commuting		.077	.066
		% Out-Commuting		.055	.144
		Change in Population 15-34		.071	.085
		Change in Overall Specialization		.033	.262
		Agriculture 1960		.043	.248
		Mining 1960		.062	.163
		Manufacturing 1960		.029	.295
		Wholesale 1960		.017	.377
		Retail		.029	.286
		Services 1960		.040	.218

[1]Zero-order correlation between independent and dependent variable.

[2]First-order partial correlation between independent and dependent variables.

Table 8

Zero-Order and Partial Correlation Coefficients Showing the Relationship of the Change in the Annual Rate of Net Migration Between the 1960's and 1970's and the Change in Overall Functional Specialization Between 1960 and 1970

Dependent Variable (Y)	Independent Variable (X)	Control Variable (Z)	rxy[1]	rxy.z[2]	Significance
Change in Net Migration Rate	Change in Overall Specialization		.106		.019
		Distance to SMSA		.095	.032
		Population Size		.060	.122
		Size of SMSA		.110	.016
		Degree of Urbanization		.042	.208
		Change in Population 15-34		-.038	.231
		Employment Change		-.048	.174
		Agriculture 1970		-.052	.207
		Mining 1970		-.042	.253
		Manufacturing 1970		-.039	.234
		Wholesale 1970		-.031	.169
		Retail 1970		-.049	.178
		Services 1970		-.049	.172

[1]Zero-order partial correlation coefficient.

[2]First-order partial correlation coefficient.

Table 3

Zero-Order and Partial Correlation Coefficients Showing the Relationship of the Change in the Annual Rate of Net Migration and Sustenance Organization Activity in 1970

Dependent Variable (Y)	Independent Variable (X)	Control Variable (Z)	r_{xy}^1	r_{xy}^2	Significance
Change in Net Migration Rate	Agriculture		.054		.215
		Distance to SMSA		.074	.140
		Population Size		.049	.238
		Size of SMSA		.046	.249
		Overall Specialization		.015	.413
		Degree of Urbanization		.094	.085
		Employment Change		.057	.203
		Change in Population 15-34		.033	.315
Change in Net Migration Rate	Mining		.263		.001
		Distance to SMSA		.253	.001
		Population Size		.254	.001
		Size of SMSA		.286	.001
		Overall Specialization		.255	.001
		Degree of Urbanization		.268	.001
		Employment Change		.262	.001
		Change in Population 15-34		.258	.001
Change in Net Migration Rate	Manufacturing		-.113		.019
		Distance to SMSA		-.061	.135
		Population Size		-.078	.076
		Size of SMSA		-.112	.021
		Overall Specialization		-.083	.064
		Degree of Urbanization		-.108	.024
		Employment Change		-.120	.011
		Change in Population 15-34		-.110	.022

Table 3 (Con't.)

Zero-Order and Partial Correlation Coefficients Showing the Relationship of the Change in the Annual Rate of Net Migration and Sustenance Organization Activity in 1970.

Dependent Variable (Y)	Independent Variable (X)	Control Variable	r_{xy}^1	r_{xy}^2	Significance
Change in Net Migration Rate	Wholesale		.034		.281
		Distance to SMSA		.003	.480
		Population Size		-.003	.478
		Size of SMSA		.019	.364
		Overall Specialization		-.007	.451
		Degree of Urbanization		-.008	.443
		Employment Change		.042	.217
		Change in Population 15-34		-.040	.227
Change in Net Migration Rate	Retail		.050		.167
		Distance to SMSA		.003	.480
		Population Size		.001	.494
		Size of SMSA		.040	.221
		Overall Specialization		.015	.387
		Degree of Urbanization		.013	.399
		Employment Change		.006	.413
		Change in Population 15-34		.024	.322
Change in Net Migration Rate	Services		.099		.027
		Distance to SMSA		.061	.121
		Population Size		.108	.019
		Size of SMSA		.108	.018
		Overall Specialization		.084	.052
		Degree of Urbanization		.129	.006
		Employment Change		.128	.007
		Change in Population 15-34		.131	.006

[1]Zero-order correlation between independent and dependent variable.

[2]First-order partial between independent and dependent variables.

Table 4

A Correlation Matrix for the Variables Used in Study of the Change in the Annual Rate of Net Migration Between the 1960's and 1970's

Variable		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Change in Net Migration Rate	(1)		.054	.263*	-.113*	.034	.050	.099*	.146*	-.217*	.112*	-.160*	-.275*
Agriculture	(2)			-.153*	-.217*	.261*	.182*	.072	-.128*	-.028	.358*	-.050	.129*
Mining	(3)				-.224*	-.111	-.223*	-.084	.101	-.074	.099	.110*	-.023
Manufacture	(4)					-.439*	-.757*	-.592*	-.400*	.174*	-.309*	.018	.035
Wholesale	(5)						.398*	.064	.203*	-.172*	.364*	-.100*	-.098*
Retail	(6)							.294*	.326*	-.226*	.322*	-.067	-.136*
Services	(7)								.287*	.026	.147*	.045	-.089*
Distance to SMSA	(8)									-.225*	.203*	-.048	-.179*
Population Size	(9)										-.191*	.131	.740*
Functional Specialization	(10)											-.083	-1.56
Size of SMSA	(11)												.090*
Degree of Urbanization	(12)												

*Statistically significant at the .05 level or less.

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Table 5

Zero-Order and Partial Correlation Coefficients Showing the Relationship of the Change in the Annual Rate of Net Migration Between the 1960's and 1970's and the Change in the Proportion of the Population Ages 15-34 Between 1960 and 1970

Dependent Variable (Y)	Independent Variable (X)	Control Variable (Z)	r_{xy}[1]	$r_{xy.z}$[2]	Significance
Change in Net Migration Rate	Change in Population 15-34		-.355		.001
		Distance to SMSA		-.345	.001
		Population Size		-.315	.001
		Degree Urbanization		-.284	.001
		Size of SMSA		-.342	.001
		Net Migration Rate Population 15-34		-.184	.001
		Employment Change		-.359	.001
		Change in Overall Specialization		-.353	.001
		Mining 1960		-.343	.001
		Agriculture 1960		-.355	.001
		Manufacturing 1960		-.351	.001
		Wholesale 1960		-.343	.001
		Retail 1960		-.349	.001
		Services 1960		-.363	.001

[1]Zero-order correlation between the independent and dependent variable.

[2]First-order partial correlations.

Table 6

Standardized Regression Coefficients (Betas) for Variables Significantly Related to the Change in the Annual Rate of Net Migration Between the 1960's and 1970's[1]

Variable	Beta Coefficient	F Ratio[2]
Change in Population 15-34	-.266	17.67
Mining Activity	.273	21.09
Degree of Urbanization	-.173	7.53
Service Activity	.161	7.44
Size of SMSA	-.149	6.23

[1] R^2=25.4 percent.

[2] All values significant at the .001 level.

FOOTNOTES

[1]This section presents a discussion integrating the theoretical rationale for and research previously conducted on the particular independent variables used in this research. The reader should note that the discussion is focused around the three main factors, already referred to. However, in the case of the first of these factors, "sustenance organizations", the discussion includes a review of several separate but not necessarily totally independent components that together form an area's sustenance organization.

[2]It is important to point out that this is a study of net migration, specifically the change in annual rates of net migration between two periods of time, 1960-1970 and 1970-74. A positive change in annual rates of net migration may be indicative of an increase in net migration, a reduction in net out-migration, or a reversal from net out to net in-migration. All of these shifts represent an increase in net population retention. Similarly, a negative change in net-migration could reflect an increase in net out-migration, a decrease in net in-migration or a reversal from net in to net out-migration. These represent decreases in population retention ability.

[3]Data for the 1960-70 and 1970-74 period were taken from the Bureau of the Census Federal State Cooperative series of county estimates (U.S. Bureau of the Census, 1974a, 1974b). Net migration was measured by subtracting natural increase from the total estimated population charge. The annual rate was computed according to the formula presented below"

$$\text{Rate of Net Migration} \frac{N}{(K)\ (1/2)\ (P2 + P1)} (100)$$

where P1 and P2 are the populations and end of the time interval respectively, K is the time interval (10 or 4), and N is the number of net migrants. (Shryock et. al., 1971: 377-80).

[4]See Shryock, Siegle et. al. (1975: 630-634) for a discussion of this method and Bowles et. al. (1975: iii-iv) for a discussion of the methodology used in obtaining the net migration estimates for 1960-70 and Bowles and Tarver (1965) for the methodology used in estimating 1950-60 net migration rates.

[5]Subroutines from the S.P.S.S. (Nie et. al., 1975) were used in this research.

[6]The zero-order relationship between urbanization and population size and change in functional specialization are r = -.245 and r = -.228 respectively while their relationships to net migration rate change are r = -.275 and r = -.217 respectively. See Table 4.

[7]We control for the overall degree of functional specialization to take into account the possibility that an area's concentration in a given activity merely reflects specialization (e.g., the production of activity in mining, agriculture, or manufacturing may be accompanied by a low degree of specialization).

[8]See Table 4 for the zero-order relationships between these variables and manufacturing and the dependent variable.

[9]Our data supported the argument of Morrison and Wheeler (1976: 22) that the changing energy outlook in the 1970's has created exploitation of energy resources as a rural "growth industry" and the findings of Morrison and McCarthy (1977: 28) that counties specializing in mining have grown faster between 1970-1975 than counties specializing in manufacturing or recreation.